

1. A 3-phase system operates at 200 kVA and 10 kV. Using these quantities as base values, find:

a) The base current and base impedance for the system.

Use these bases below:

b) Express the following as a per-unit values

$$V_L := 8 \cdot \text{kV}$$

$$I_L := 12 \cdot \text{A}$$

$$\mathbf{I}_L := (5 + 2j) \cdot \text{A}$$

$$P := 40 \cdot \text{kW}$$

$$Q_{1\phi} := 20 \cdot \text{kVAR}$$

$$\mathbf{Z} := 1.2 \cdot \text{k}\Omega \cdot e^{-j \cdot 10 \cdot \text{deg}}$$

c) The line voltage represented by  $V_{\text{pu}} := 0.98 \cdot \text{pu}$

d) The line-to-neutral voltage represented by  $V_{\text{pu}} := 1.04 \cdot \text{pu}$

e) The real power represented by  $P_{\text{pu}} := 0.3 \cdot \text{pu}$

f) The single-phase power represented by  $P_{\text{pu}} := 0.3 \cdot \text{pu}$

g) The single-phase reactive power represented by  $S_{\text{pu}} := 0.4 \cdot e^{j \cdot 14 \cdot \text{deg}} \cdot \text{pu}$

h) The line current represented by  $\mathbf{I}_{\text{pu}} := (0.5 + 0.2j) \cdot \text{pu}$

i) The impedance represented by  $\mathbf{Z}_{\text{pu}} := 2.8 \cdot \text{pu} \cdot e^{j \cdot 24 \cdot \text{deg}}$

